10th Class 2020

Biology	Group-I	Paper-II
Time: 1.45 Hours	(Subjective Type)	Max. Marks: 48

(Part-I)

2. Write short answers to any FIVE (5) questions: (10)

(i) What are intercostal muscles?

Ans The chest-wall is made up of 12 pairs of ribs and the rib muscles called intercostal muscles.

(ii) Write the causes and symptoms of emphysema.

Ans More concentration of air pollutants in the atmosphere, tobacco and cigarette smoking, and air with the different chemicals are some causes of emphysema. Emphysema is the destruction of the walls of the alveoli. The symptoms of emphysema include shortness of breath, fatigue, recurrent respiratory infections and weight loss.

(iii) What is passive smoking? How it is dangerous?

Ans Passive smoking is the inhalation of smoke from another's smoking. It is also a cause of lung cancer. The smoke from the burning end of a cigarette is more dangerous than the smoke from the filter end.

(iv) Define excretion.

Ans Excretion is a process of homeostasis. In this process, the metabolic wastes are eliminated from body to maintain the internal conditions at equilibrium.

(v) Write the causes and symptoms of kidney stones.

Ans The major causes of kidney stones are age, diet (containing more green vegetables, salts, vitamins C and D), recurring urinary tract infections, less intake of water, and alcohol consumption. The symptoms of kidney stones

include severe pain in kidney or in lower abdomen, vomiting, frequent urination and foul-smelling urine with blood and pus.

(vi) Define sensory neurons and motor neurons.

Ans **Sensory neurons:**

These conduct sensory information (nerve impulse) from receptors towards the CNS.

Motor Neurons:

These carry information from interneurons to muscle or glands (effectors).

(vii) Write two main functions of spinal cord.

Ans Following are two main functions of spinal cord:

1. Spinal cord transmits nerve impulses from body parts to brain and from brain to body parts.
2. Spinal cord also acts as a coordinator, responsible for some simple reflexes.

(viii) What is paralysis? Write its cause.

Ans Paralysis is the complete loss of function by one or more muscle groups. It is most often caused by damage to the central nervous system (brain or spinal cord). The damage may be due to stroke (rupture in a blood vessel of brain or spinal cord), blood clotting in these blood vessels or poison produced by polio viruses.

3. Write short answers to any FIVE (5) questions: (10)

(i) Define compact and spongy bone.

Ans The hardest layer of the bone, on the outside, is called compact bone.

The interior of bone is soft and porous. It is called spongy bone. Spongy bone contains blood vessels and bone marrow.

(ii) What is exoskeleton? Give one example.

Ans The skeletal system of some invertebrates is on the outside of the body, and is called exoskeleton. Its example is arthropods.

(iii) Define alternation of generation in plants.

Ans The phenomenon in which two different generations alternate with each other during life cycle is known as alternation of generations.

(iv) Define Spermatogenesis and Oogenesis.

Ans The production of sperms in testes is called spermatogenesis, and the production of egg cells in ovaries is called oogenesis.

(v) Write difference between continuous and discontinuous variations.

Ans In continuous variations; the phenotypes show a complete range of measurements from one extreme to the other. Height, weight, feet size, intelligence, etc. are examples of continuous variations.

Discontinuous variations show distinct phenotypes. The phenotypes of such variations cannot be measured. Blood groups are a good example of such variations.

(vi) Define co-dominance with example.

Ans Co-dominance is the situation where two different alleles of a gene pair express themselves completely, instead of showing a dominant-recessive relationship. As a result, the heterozygous organism shows a phenotype that is different from both homozygous parents. An example of co-dominance is the expression of human group AB.

(vii) **Define nucleosomes.**

Ans The structures formed by the wrapping of DNA around histone proteins is called nucleosomes.

(viii) **Differentiate between dominant allele and recessive allele.**

Ans When in the heterozygous condition, one allele masks or prevents the expression of the other, it is called the dominant allele.

The allele which is not expressed is called recessive. The dominant alleles are represented by capital letters and recessive alleles by lower case letters.

4. Write short answers to any FIVE (5) questions: (10)

(i) **What is denitrification?**

Ans It is a biological process, in which nitrates and nitrites are reduced to nitrogen gas by denitrifying bacteria. By this process, nitrogen is return to atmosphere.

(ii) **Define community.**

Ans All the populations that live in a habitat and interact in different ways with one another is called as community.

(iii) **What is trophic level?**

Ans In an ecosystem, energy as well as materials travel from one trophic level to the next. Trophic (food) level is the level at which an organism feeds in food chain. The first trophic level is made of producers; the second of primary consumers, and so on.

(iv) **Differentiate between ectoparasites and endoparasites.**

Ans Ectoparasites live outside *i.e.*, on the surface of host's body and get food from there. Mosquitoes, leeches, lice, etc. are the examples of ectoparasites.

Endoparasites live inside the body of host and get food and shelter. Bacteria, viruses, tapeworm, Ascaris, Entamoeba, Plasmodium, etc. are the examples of endoparasites.

(v) What is recombinant DNA?

Ans Genetic engineering or recombinant DNA technology involves the artificial synthesis, modification, removal, addition and repair of the genetic material (DNA). If host organism is a microorganism, such as a bacterium, the transferred DNA is multiplied many times as the microorganism multiplies. Consequently, it is possible to obtain millions of copies of a specific DNA inside a bacterial cell.

(vi) What is fermenter?

Ans Fermenter is a device that provides optimum environment to microorganisms to grow into a biomass, so that they can interact with a substrate, forming the product. In fact, the fermenter constitutes the heart of any industrial fermentation process.

(vii) Define drug.

Ans Any substance that, when absorbed into the body of a living organism, alters normal body function is known as a drug.

(viii) What is a vaccine?

Ans A vaccine is a material containing weakened or killed pathogens and is used to produce immunity to a disease by stimulating the production of antibodies.

(Part-II)

NOTE: Attempt any TWO (2) questions.

Q.5.(a) Write a note on structure of nephron. (4)

Ans For Answer see Paper 2017 (Group-I), Q.5.(a).

(b) Explain reflex action. (5)

Ans **Reflex Action:**

When central nervous system sends impulses to muscles and glands, two types of actions (responses) result:

1. The higher centres of brain control the conscious action or voluntary actions.
2. When impulses are not passed to the higher centres of brain, it results in responses which are not under conscious control. Such responses are called involuntary actions. Sometimes, the involuntary response produced by the CNS is very quick. Such a response is called reflex action. The pathway followed by the nerve impulses for producing a reflex action, is called reflex arc.

The most common example of reflex action is the withdrawal of hand after touching a hot object. In this reflex action, spinal cord acts as coordinator. Heat stimulates temperature and pain receptors in skin. A nerve impulse is generated which is carried by sensory neurons to the interneurons of spinal cord. From interneurons, the impulse is passed to motor neurons, which carry it to the muscles of arm. As a result, the muscles contract to withdraw hand. During it, other interneurons transmit nerve impulses up to brain so that the person becomes aware of pain and what happened.

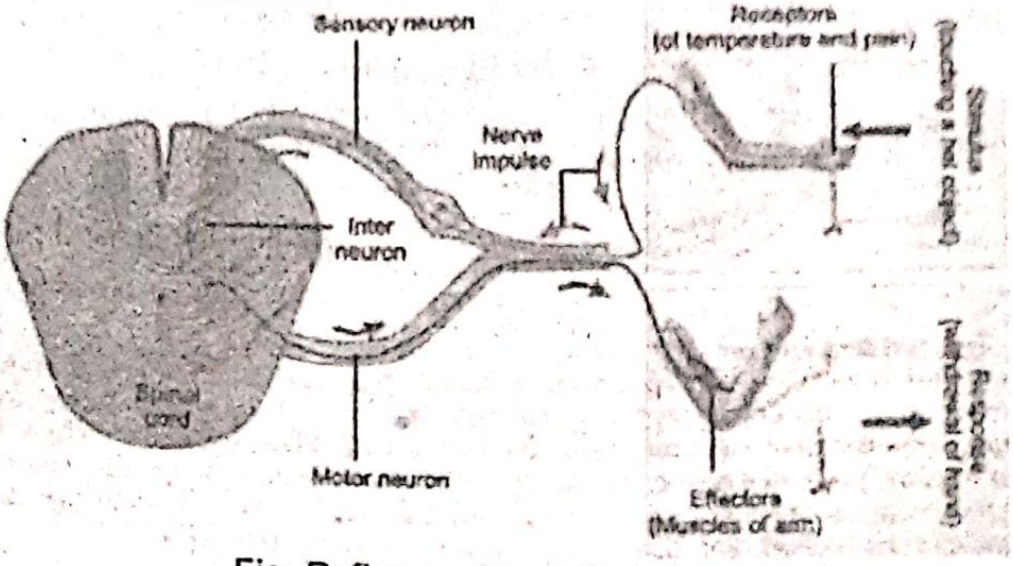

Fig. Reflex arc in a reflex action.

Q.6.(a) Explain axial and appendicular skeleton. (4)

Ans **Axial Skeleton:**

Axial skeleton consists of the 80 bones in the head and trunk of body. It is composed of five parts. Skull contains 22 bones out of which 8 are cranial bones (enclosing the brain) and 14 are facial bones. There are 6 middle ear ossicles (3 in each ear). There is also a hyoid bone in neck. Vertebral column contains 33 bones (vertebrae). The chest is made of a chest bone called sternum and 24 (12 pairs) ribs.

Appendicular Skeleton:

Appendicular skeleton is composed of 126 bones. Pectoral (shoulder) girdle is made of 4 bones. Arms have 6 bones. Both hands have 54 bones. Pelvic girdle (hips) has 2 bones. Legs have 6 bones. Both feet have 54 bones.

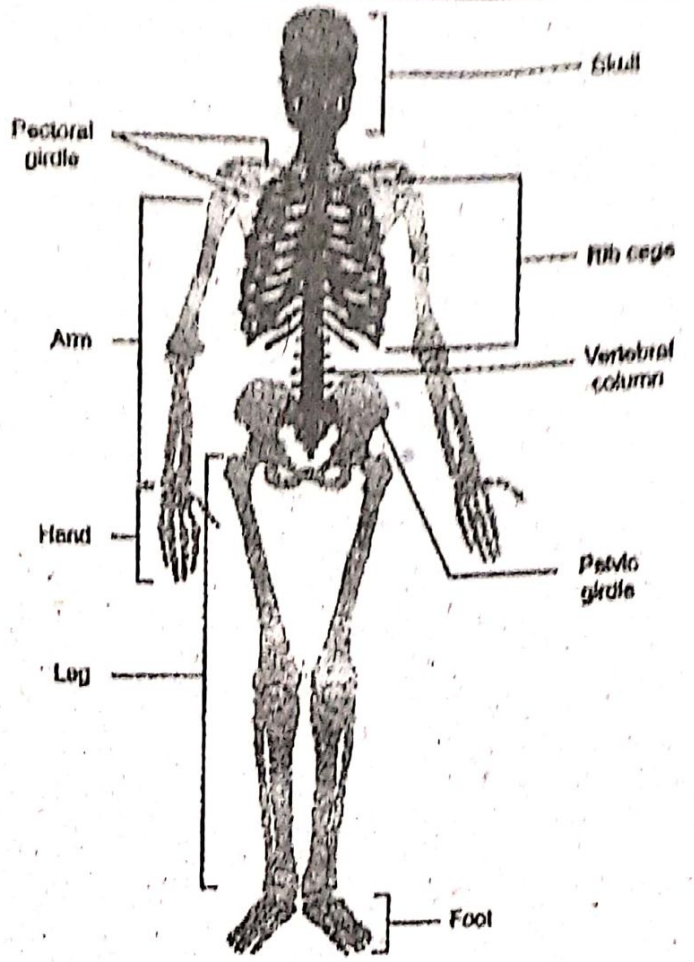

Fig. Human Skeleton.

(b) Write five advantages of vegetative propagation of plants. (5)

Ans Five advantages of vegetative propagation of plants are:

(i) The offsprings produced through vegetative propagation are genetically identical. Therefore, beneficial characteristics can be preserved.

(ii) In vegetative propagation, there is no need of any mechanism of pollination.

(iii) It helps to increase number of plants at a rapid rate.

(iv) The organs of vegetative propagation enable many plants to pass over unfavourable conditions.

(v) Plants bearing seedless fruits can be grown only by vegetative propagation.

Q.7.(a) Describe the importance of biotechnology in the fields of medicine and environment. (4)

Ans **Biotechnology in the Field of Medicine:**

In the field of medicine, biotechnologists synthesized Insulin and Interferon (antiviral proteins) from bacteria and released for sale. A large number of vaccines and antibodies; human growth hormone and other medicines have also been produced. Various enzymes are being synthesized for medicinal as well as industrial use. Gene therapy (treatment through genes) has become important in recent years. Biotechnology also proved much beneficial in forensic medicine. The study of DNA helps in the identification of criminals.

Biotechnology and Environment:

Biotechnology is also being used for dealing with environmental issues, like pollution control, development of renewable sources for energy, restoration of degraded lands and biodiversity conservation. Bacterial enzymes are used to treat sewage water to purify. Microbes are being developed to be used as biopesticides, biofertilizers, biosensors, etc. Such transgenic microorganisms are also used for the recovery of metals, cleaning of spilled oils and for many other purposes.

(b) Describe five sources of drug production. (5)

Ans Drugs are obtained from the following sources:

(i) Sythetic Drugs:

Such drugs do not occur naturally but are synthesized in laboratory. Pharmaceutical companies produce these drugs, *e.g.,* aspirin.

(ii) Drugs from Plants and Fungi:

Many important medicines are obtained from plants and fungi. These medicines include antibiotics, cardiotonics and certain analgesics. The antibiotic penicillin comes from a fungus. The cardiotonic, known as digitalis, is used to stimulate the heart. It is made from the leaves of purple flowered plant, foxglove.

The pain reliever morphine is made from opium, which comes from the juice of opium poppy plant.

(iii) Drugs from Animals:

Drugs obtained from animals are usually their glandular products. Fish liver oils, musk, bees' wax, certain harmones and antitoxins are obtained from animal sources.

(iv) Drugs from Minerals:

Several common drugs are produced from minerals. The mineral iodine is used in making tincture of iodine, a liquid that helps prevent infection when applied to cuts and bruises. The powder form of silver nitrate is applied on wounds to stop bleeding and prevent infection.

(v) Drugs from Bacteria:

Many antibiotics *e.g.*, streptomycin are obtained from bacteria.